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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/944,166	09/04/2001	Kazuhito Okayama	0102/0180	9857
21395	7590	07/07/2005	EXAMINER	
LOUIS WOO LAW OFFICE OF LOUIS WOO 717 NORTH FAYETTE STREET ALEXANDRIA, VA 22314			JACKSON, JAKIEDA R	
		ART UNIT	PAPER NUMBER	
		2655		

DATE MAILED: 07/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	09/944,166	OKAYAMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Jakieda R Jackson	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 16 November 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 1,4-7 and 9-16 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) 1,4-7,9,10,12 and 13 is/are allowed.  
 6) Claim(s) 11 and 14-16 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

**DETAILED ACTION**

***Response to Amendment***

1. In response to the Office Action mailed July 16, 2004, applicant submitted an amendment filed on November 16, 2004, in which the applicant canceled claims 2-3 and 8, amended claims 9-11 and added claims 12-16.

***Response to Arguments***

2. Claims 1, 7 and 11 have been amended to include the limitation of claims 2-3, in addition, add new issues. Claim 1, 7 and 11, include an audio signal processing apparatus, method and computer-readable program in which a waveform of a digital audio signal to be replayed is processed, the apparatus comprising:

detecting means for detecting an interval of time between two adjacent waveform peaks of the low-pass filtered digital audio signal, a polarity of gradient of the waveform changing at each of the two adjacent waveform peaks and the interval of time being detected by measuring the number of times of sampling based on the converted sampling frequency.

Applicant(s) argue that in Covell as well as Takahashi and Ding IEEE, there is neither description nor even a hint of the configuration that "the interval of time is detected by measuring the number of times of sampling based on the converted sampling frequency.

Applicant's arguments, see pages 7-9, filed November 16, 2004, with respect to claims 1, 7 and 11 have been fully considered and are persuasive. The rejection of claims 1, 7 and 11 has been withdrawn.

***Claim Objections***

3. Claims 15 and 16 are objected to because of the following informalities:
  - They are interpreted as depending on claim 14, since the preamble of those claims link to a computer-readable program. Otherwise, claim 16 does not further limit claim 13.

Appropriate correction is required.

***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. **Claims 11 and 14-16** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 11 and 14-16 are drawn to a "program" *per se* as recited in the preamble and as such are non-statutory subject matter. See MPEP § 2106.IV.B.1.a. Data structures not claimed as embodied in computer readable media are descriptive material *per se* and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361,31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention, which permit the data structure's

functionality to be realized. In contrast, a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory. Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

### ***Allowable Subject Matter***

6. **Claims 1, 4-7, 9-10 and 12-13** are allowed.

The following is a statement of reasons for allowance:

As for independent claims 1 and 7, they recite an audio signal processing apparatus and method in which a waveform of a digital audio signal to be replayed is processed. Prior art such as Covell, Takahashi and Ding IEEE show similar apparatuses and methods but fails to teach nor reasonably suggest the recited combination wherein it teaches a frequency bandwidth expanding means, low-pass filtering means, detecting means wherein a polarity of gradient of the waveform changing at each of the two adjacent waveform peaks and the interval of time being detected by measuring the number of times of sampling based on the converted

sampling frequency, difference data calculating means, weighting means and producing means. Ding teaches that for a frame with several pitch periods, the polarity decision of the frame is made by the majority of decisions of pitch-synchronous positive and negative polarity. Then each frame has a value of polarity. The majority decision includes all waveform peaks including the adjacent waveform peaks and if one unreliable segment with many pitch periods produce only one bad decision, it has little influence on the final decision. Also, Ding teaches that the time interval (pitch period) is detected between the two adjacent waveform peaks (pages 858-859, section 2.2-2.3). However, Ding does not specifically teach that the interval of time is being detected by measuring the number of times of sampling based on the converted sampling frequency or the combination as recited above.

Dependent claims 4-6, 9-10 and 12-13 are allowed because they further limit their parent claims.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Yokozawa et al. (USPN 6,570,722) discloses a method using signal peak point intervals.
- HSU (USPN 6,717,984) discloses a method for analyzing sample waveform in the time domain.

Art Unit: 2655

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 571.272.7619. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571.272.7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JRJ  
June 24, 2005



SUSAN MCFADDEN  
PRIMARY EXAMINER